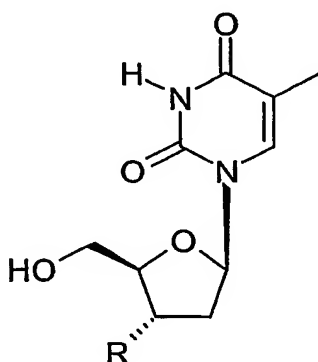


Claims

1. A method for determining thymidine kinase 1 activity in a human or animal body fluid or cell or tissue sample, comprising the steps of reacting said sample with a substrate for said thymidine kinase 1 which substrate is a 3'-derivative of thymidine in the presence of a phosphate donor and a buffer system and determining the amount of 5'-phosphorylated 3'-derivative of thymidine formed, said amount being related to said thymidine kinase 1 activity.
2. A method according to claim 1, wherein a substrate for TK1 is a 3'-deoxy-thymidine derivative of formula I



in which R is selected from but not limited to the group consisting of NH_2 , NHCOCH_3 , SC_2H_5 , OC_2H_5 , OBn , N_3 , NO_2 , OCOCH_3 , OSO_2CH_3 and F.

3. A method according to claims 1 and 2, wherein the 3'-derivative of thymidine is AZT and the 5'-phosphorylated 3'-derivative of thymidine is AZTMP.
4. A method according to claims 1 to 3, wherein the amount of said 5'-phosphorylated 3'-derivative of thymidine formed is determined by an immunological method comprising reacting the 5'-phosphorylated 3'-derivative of thymidine formed with at least one antibody capable of selectively reacting with the 5'-phosphorylated 3'-derivative of thymidine to form immunocomplexes.
5. A method according to claim 4, wherein the amount of 5'-phosphorylated 3'-derivative of thymidine is determined by an immunological method using chemiluminescence.
6. A method according to claims 4 and 5, wherein the amount of said 5'-phosphorylated 3'-derivative of thymidine formed is determined by enzyme linked immunosorbent assay (ELISA).
7. A method according to claims 1 to 6 wherein said buffer comprises at least Dithioerythritol (DTE), ATP, MgCl_2 and HEPES or Tris and provides a pH from 6.5 to 8.0.

8. A method according to claims 1 to 6, wherein Uridine monophosphate (UMP) is contained in said buffer.
9. A method according to claims 1 to 6 wherein said substrate is present in a concentration of at least 0,4 μ M.
- 5 10. A method according to claims 1 to 6 wherein said phosphate donor is present in a concentration of 0,1-10 mM.
11. Use of a method according to one of the forgoing claims for the diagnosis of diseases involving elevated levels of thymidine kinase 1 activity.
12. Use according to claim 11 for diagnosing cancer or tumours and for monitoring the
10 progression of cancer or tumours.
13. Use according to claim 12 wherein cancer is selected from the group consisting of haematological cancer, breast cancer, gastrointestinal cancer and prostate cancer.
14. Use according to claim 11 for the identification of a subgroup of patients at high risk of disease progression in Non-Hodgkin's lymphoma and chronic lymphocytic leukaemia.
- 15 15. An in vitro method for diagnosing and/or therapeutic monitoring of diseases in a human or animal characterised in having elevated levels of thymidine kinase 1 activity comprising the steps of a) obtaining a sample of human or animal body fluid or a cell or tissue sample; b) assaying the sample to determine the thymidine kinase 1 activity according to a method of claims 1 to 10; and c) relating the amount of thymidine
20 kinase 1 activity to the clinical status of the human or animal.
16. A kit for the in vitro diagnosis and/or therapeutic monitoring of diseases in a human or animal characterised in having elevated levels of thymidine kinase 1 activity comprising a) a 3'-derivative of thymidine; b) a phosphate donor; c) a buffer; and d) at least one antibody capable of selectively reacting with the 5'-phosphorylated 3'-
25 derivative of thymidine.
17. A kit according to claim 16, wherein the 3'-derivative of thymidine is AZT and wherein the 5'-phosphorylated 3'-derivative of thymidine is AZTMP.
18. A kit according to claims 16 and 17 additionally comprising UMP.
19. A kit according to claim 16 to 18, wherein the reagents are packed together in a
30 container.